Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

Port Orford White-Cedar

(*Chamaecyparis lawsoniana*)

By H. S. Betts, *senior engineer Division of Forest Products*

The demand for Port Orford white-cedar (commonly called Port Orford cedar) has resulted in heavy cutting of the limited supply, and a shortage of accessible material is indicated in the not distant future. It is, of course, highly desirable that measures be taken to insure satisfactory reproduction on areas that have been logged, but even if this is done, the new timber will not reach commercial size for many years. The tree grows naturally only in a narrow belt on the coast of southern Oregon and northern California. It is noted for its beauty and size. Mature trees sometimes attain a height of 200 feet and a diameter of 8 feet, and reach an age of approximately 600 years. The wood of Port Orford cedar is unusually fine and uniform in texture, and the form of the tree is such that it furnishes a comparatively high proportion of large clear pieces. This clear material is in great demand for storage battery separators and venetian blinds.

Nomenclature.—Port Orford white-cedar, commonly called Port Orford cedar, is sometimes locally known as Lawson's cypress, Oregon cedar, and white-cedar.

Distribution and growth.—Port Orford cedar grows along the Pacific coast from Coos Bay in Oregon, southward to the Mad River in Humboldt County, California. It is found from within a few miles of the sea to from 10 to 40 miles or more inland and up to 5,000 feet elevation on westward slopes of the mountains of the Coast Range (fig. 1). The bulk of the timber of commercial importance is confined to a strip from 20 to 25 miles wide along the seacoast in Coos and Curry Counties in Oregon. This is part of the "fog-belt" region, characterized by moderate temperatures, heavy precipitation, high humidity, and many cloudy days.

Mature trees of Port Orford cedar generally range from 125 to 180 feet in height and from 3½ to 6 feet in diameter. Trees from 16 to 20 inches in diameter are generally about 200 years old. Port Orford cedar is quite tolerant of shade in early life but less so later. It is sensitive to sudden changes of temperature and suffers from drought. Within its restricted range it generally occurs scattered through forests of Douglas-fir, hemlock, and western redcedar. Pure stands occasionally occur in sheltered coves, but they are rare and of small area. The tree is a prolific annual seeder, but the seeds are carried only a short distance from the parent tree. The rate of germination is fairly high under favorable conditions of shade and humidity.

Supply.—A forest survey of the Pacific Northwest begun in 1930[1] showed a stand of Port Orford cedar in western Oregon of 1,378,800,000

---

[1] Conducted by the Pacific Northwest Forest and Range Experiment Station as part of a Forest Survey of the United States.

Forest Service
U. S. DEPARTMENT OF AGRICULTURE
American Woods September 1945

663819°—45

board feet.[2] This stand has been markedly reduced by heavy cutting in the last few years [3] and in January 1942 was placed at 690,000,000 board feet.[4] Estimates for the stand of Port Orford cedar in California are not available. In Oregon the average annual reported lumber cut of Port Orford cedar in recent years [5] has been approximately 8.4 percent of the stand. If the same ratio is assumed for California, the stand would be roughly 55 million board feet, and the total stand of Port Orford cedar of saw-timber size would be approximately 745 million board feet. What proportion of this timber can be logged at reasonable cost is not known. The most accessible stands have already been cut.

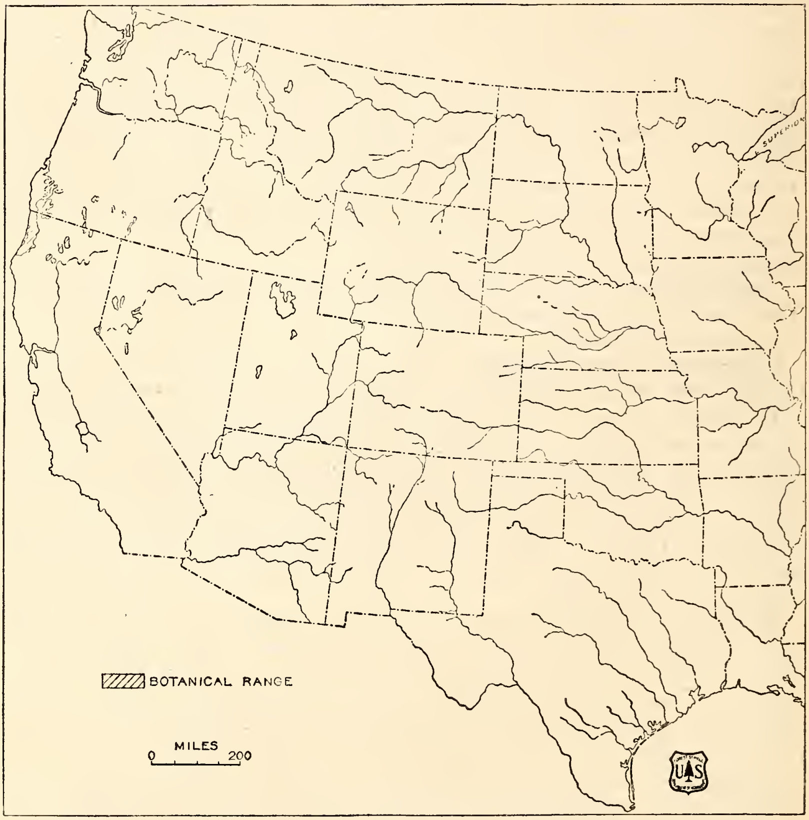

FIGURE 1.—Range of Port Orford white-cedar (*Chamaecyparis lawsoniana*).

Production.—In the lumber production statistics of the Bureau of the Census the only years in which Port Orford cedar is listed separately from the other cedars [6] are 1940, 1941, 1942 and 1943. In those years the cut in Oregon ranged from 54,211,000 board feet (1940) to 66,511,000 board feet (1941) and the cut in California from 2,981,000 board feet (1940) to 6,195,000 board feet (1941). The average annual cut of Port Orford cedar for the two States combined during the 4-year period 1940–1943 was approximately 62 million board feet.

---

[2] ANDREWS, H. J., and COWLIN, R. W. FOREST RESOURCES OF THE DOUGLAS-FIR REGION. U. S. Dept. Agr. Misc. Pub. 389, 169 pp., illus. 1940.

[3] Due largely to the increased demand for wooden battery separators for war purposes.

[4] Findings of the Pacific Northwest Forest and Range Experiment Station.

[5] 1940, 1941, and 1942.

[6] The term "cedar" as used in the lumber-cut statistics of the Bureau of the Census for Oregon and California prior to 1940 includes Port Orford cedar, Western redcedar, and California incense-cedar.

In addition to the Port Orford cedar sawed into lumber, considerable quantities of high-grade logs and bolts are cut into veneer and dimension stock by plants other than sawmills. This material is not included in the lumber production statistics reported by sawmills. It amounted to the equivalent of about 29 million board feet in 1940.[7]

The average annual cut of Port Orford cedar in recent years for lumber, veneer, and dimension stock, including also an allowance for railroad ties, mine timbers, etc., is roughly estimated at 95 million board feet.

Properties.—The heartwood of Port Orford cedar is light yellow to pale brown in color. The thin sapwood is hardly distinguishable. The texture is fine and unusually uniform, and the grain is generally straight. The wood is moderately light in weight,[8] stiff, moderately strong, moderately hard, and moderately resistant to shock. In durability Port Orford cedar is classed with the woods having the greatest resistance to decay [9] such as the other cedars, redwood, and cypress. The wood is capable of taking a good polish and holds paint very satisfactorily. It has a pleasant, spicy odor. This odor, which is due to a volatile oil, becomes very pronounced in mills sawing Port Orford cedar logs, and men subjected to it continuously without protection for several days suffer an affection of the kidneys.[10] The wood shrinks moderately, has little tendency to warp and cup in kiln-drying operations, and stays in place well after it has been seasoned.

Principal uses.—A large proportion of the high-grade Port Orford cedar logs are used in the manufacture of battery separators and venetian-blind slats. Less important uses are "mothproof" boxes and closets, sash and door construction, flooring, interior finish, furniture, boat building, etc.[11] The lower grades go largely into general construction, dock plank, ties, and mine timbers.

No other wood has yet been found that is as satisfactory as Port Orford cedar for separators in storage batteries. Battery stock is manufactured as sliced, rotary cut, or resawn veneer. After drying, the sheets of veneer are cut to size [12] and then grooved on one side. Certain extractives in the veneer are removed by treatment with sodium hydroxide, followed by washing in hot water. This treatment renders the wood more permeable to the electrolite. The washed separators are stored in humidifiers so as to keep them wet for assembly in storage batteries. Battery material is shipped throughout the United States and abroad as sheets of veneer, as ungrooved blanks, or as finished separator plates.

---

[7] See table 1, second and third columns. The veneer used by plants manufacturing products made from veneer (largely battery separators) may be made by these plants from logs or bolts or may come from other plants which manufacture veneer but not veneer products.

[8] The average weight of Port Orford cedar in an air-dry condition (12 percent moisture) is 29 pounds per cubic foot.

[9] Refers to heartwood. The sapwood of all species has low resistance to decay.

[10] Masks are generally used both as a protection against the volatile oil and also against the fine dust that results from sawing Port Orford cedar.

[11] Block matches, formerly used by woodsmen and prospectors, were made from Port Orford cedar. These matches commonly known as sulfur matches or "stinkers," could be dried after a wetting and would still retain their ability to ignite. The blocks, after being cut to match length, were smoothed on one end and crushed on the other end so that the fibers became matted together. The smooth end of the block was sliced in one direction with sharp, parallel knives down to the matted fibers and then sliced at right angles to the first cuts, thus forming matchsticks held together at one end by the crushed fibers. After being dipped in sulfur and phosphorus, the blocks were broken into squares and packed in boxes which contained about 1,200 matches and sold for 5 cents. It is understood that the manufacture of these matches has been discontinued.

[12] Battery separators for motor cars generally range in size from 5 1/8 to 5 7/8 inches in height and from 5 3/16 to 5 5/8 inches in width and are generally from 5/64 to 1/10 inch thick. Submarine-battery separator plates range from 16 to 20 inches in height and from 32 to 50 inches in width and are generally from 1/19 to 1/8 inch thick.

The increased use of venetian blinds within the last few years has caused a marked increase in the consumption of the various woods used for slat[13] manufacture.[14] The close, uniform texture of Port Orford cedar, its ability to stay in place, and its excellent paint-holding properties have long made it one of the preferred woods for this use.[15]

For boat construction the wood ranks high on account of its texture, ability to stay in place, and lasting qualities, combined with the necessary strength properties.[16]

TABLE 1.—*Quantities of Port Orford cedar used in the manufacture of wooden products in 1940* [1]

[Includes lumber, veneer, and logs and bolts.]

Classes of products	Lumber	Veneer [2]	Logs and bolts [2]	Total
	1,000 ft. B. M.	*1,000 ft. B. M.*	*1,000 ft. B. M.*	*1,000 ft. B. M.*
Boxes, baskets, and crating	494		1,512	2,006
Car construction and repair	2			2
Electrical equipment (battery plates)	7,343	5,005	16,141	28,489
Flooring	718			718
Furniture	290	6		296
Handles	4			4
Instruments, musical	2			2
Sash, doors, general millwork	872			872
Ship and boat building	261			261
Shuttles, spools, bobbins, looms	129			129
Signs, scenery, displays	131			131
Sporting and athletic goods	132		9	141
Venetian blinds	9,691		6,309	16,000
Woodenware and novelties	9			9
Total	20,078	5,011	23,971	49,060

[1] The only year for which this information is available for Port Orford cedar as a separate species.
[2] Quantities expressed in equivalent board feet.

REFERENCES

LUMBER USED IN MANUFACTURE—1940. (Summary Tables) U. S. Forest Service, Preliminary Statistics—Forest Survey of the United States.

PORT ORFORD CEDAR. U. S. Forest Service Silvical Leaflet 2, 3 pp. 1907.

PORT ORFORD CEDAR—CHARACTERISTICS, USES. Lumber and Veneer Consumer. 1921.

PORT ORFORD CEDAR: ITS PROPERTIES AND USES. 32 pp., illus. 1929. Marshfield, Oregon.

PORT ORFORD CEDAR AND SELECTIVE LOGGING. J. V. Hofmann. Timberman 23 (6): 66, 68, 70, illus. 1922.

USES OF PORT ORFORD CEDAR. H. H. SMITH. Hardwood Rec. 37 (4): 30–31, illus. 1913.

---

[13] Slats are approximately ⅛ inch thick, 2½ inches wide, and up to about 8 feet long.

[14] The annual consumption of all the various woods used for venetian-blind slats not many years ago was estimated at less than 5,000,000 board feet. In 1940 it was over 55,000,000 board feet.

[15] Basswood and California incense-cedar are other preferred woods. Magnolia and ponderosa pine are also coming into considerable use for blind slats.

[16] Sir Thomas Lipton is reported to have insisted that his cup challengers be built of Port Orford cedar.

U. S. GOVERNMENT PRINTING OFFICE: 1945

For sale by the Superintendent of Documents, U. S. Government Printing Office
Washington 25, D. C. - Price 5 cents